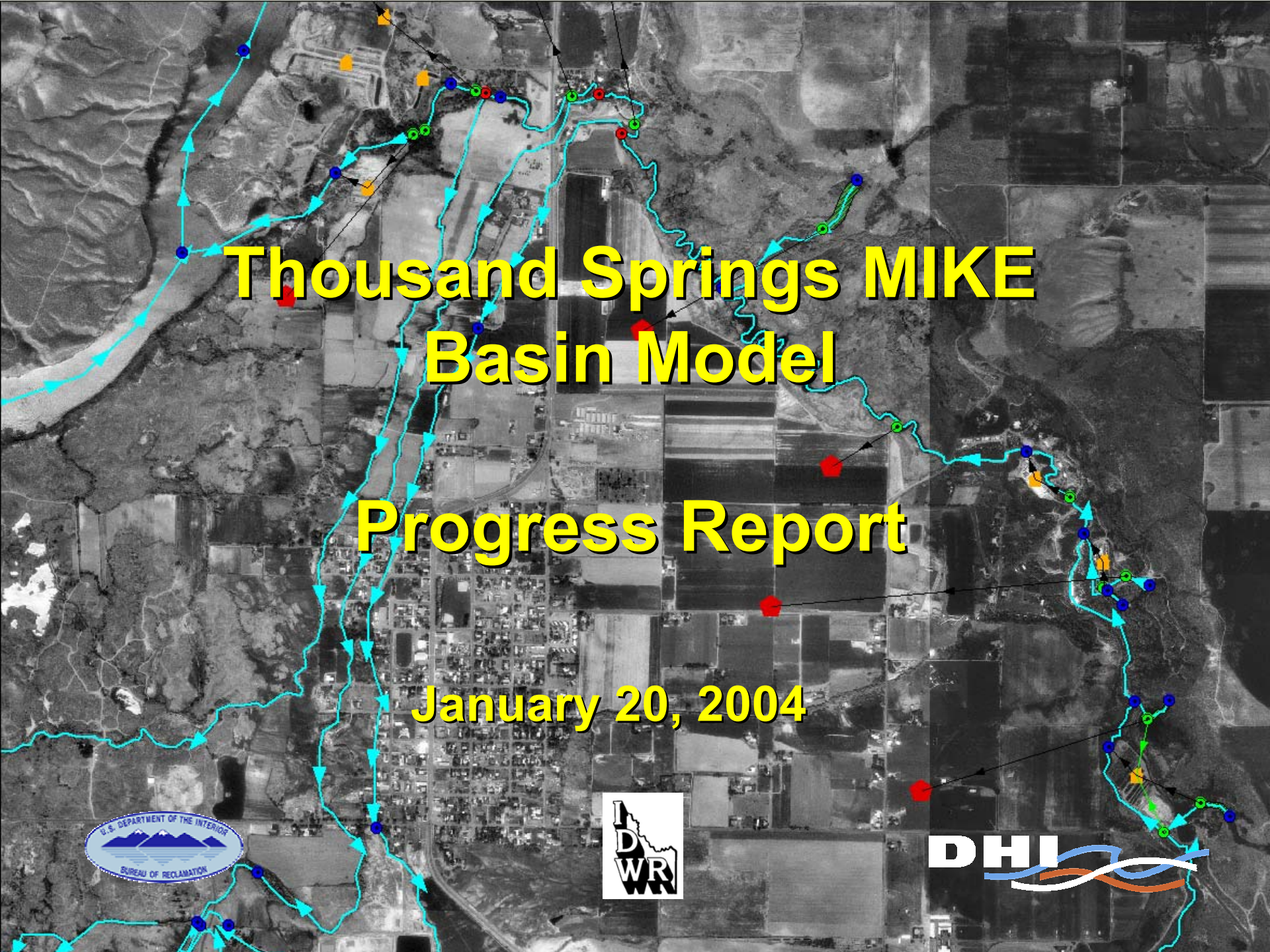
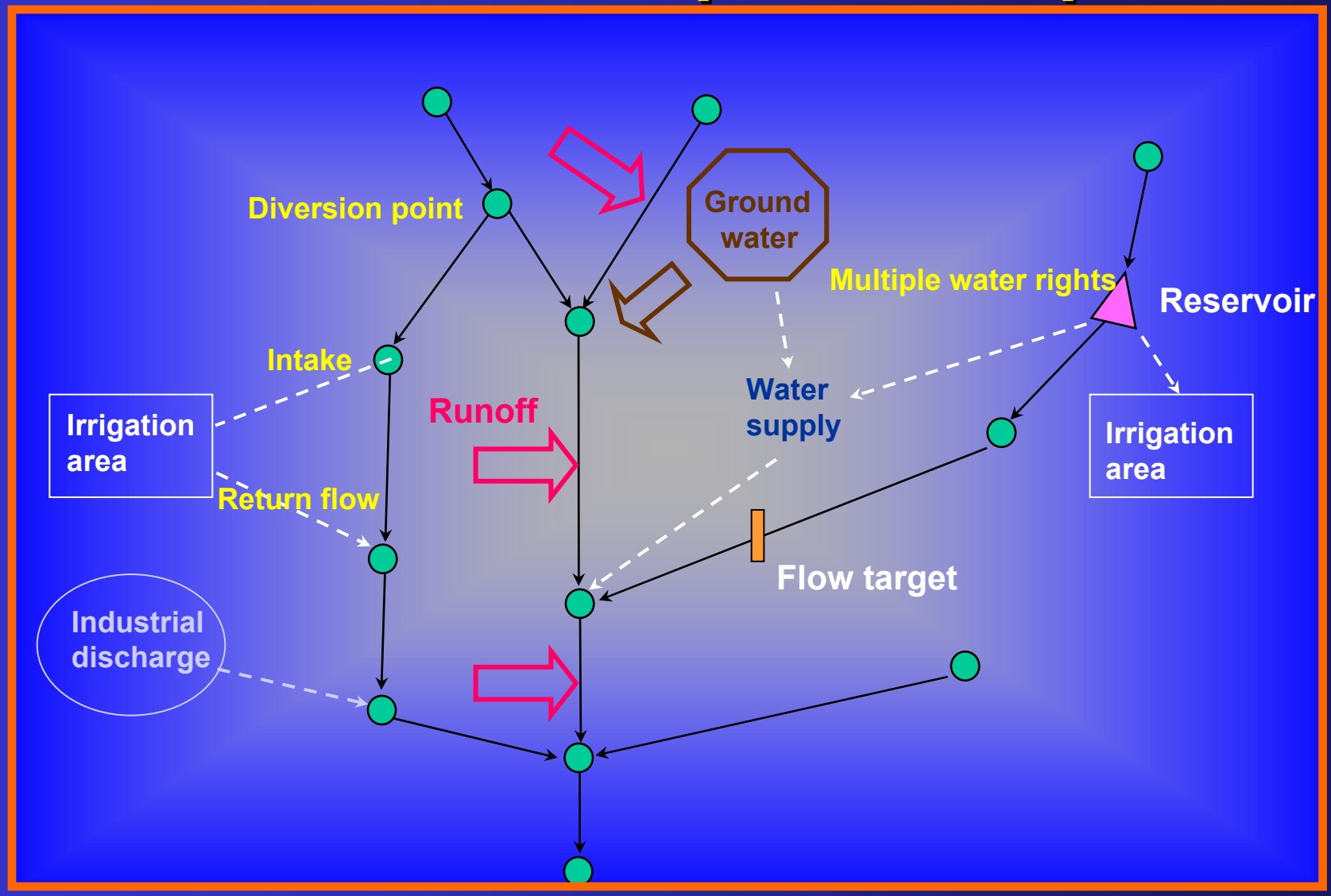
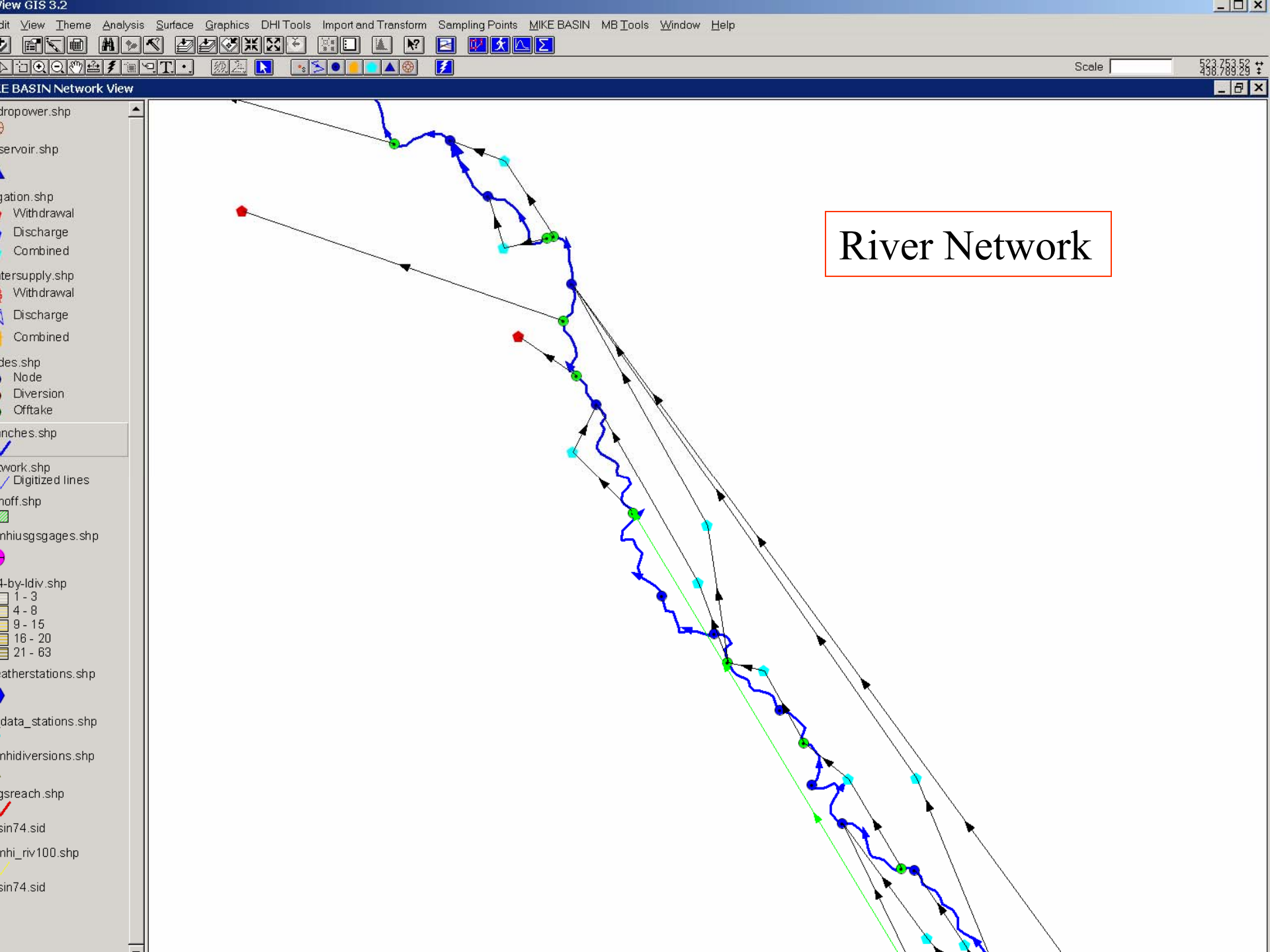
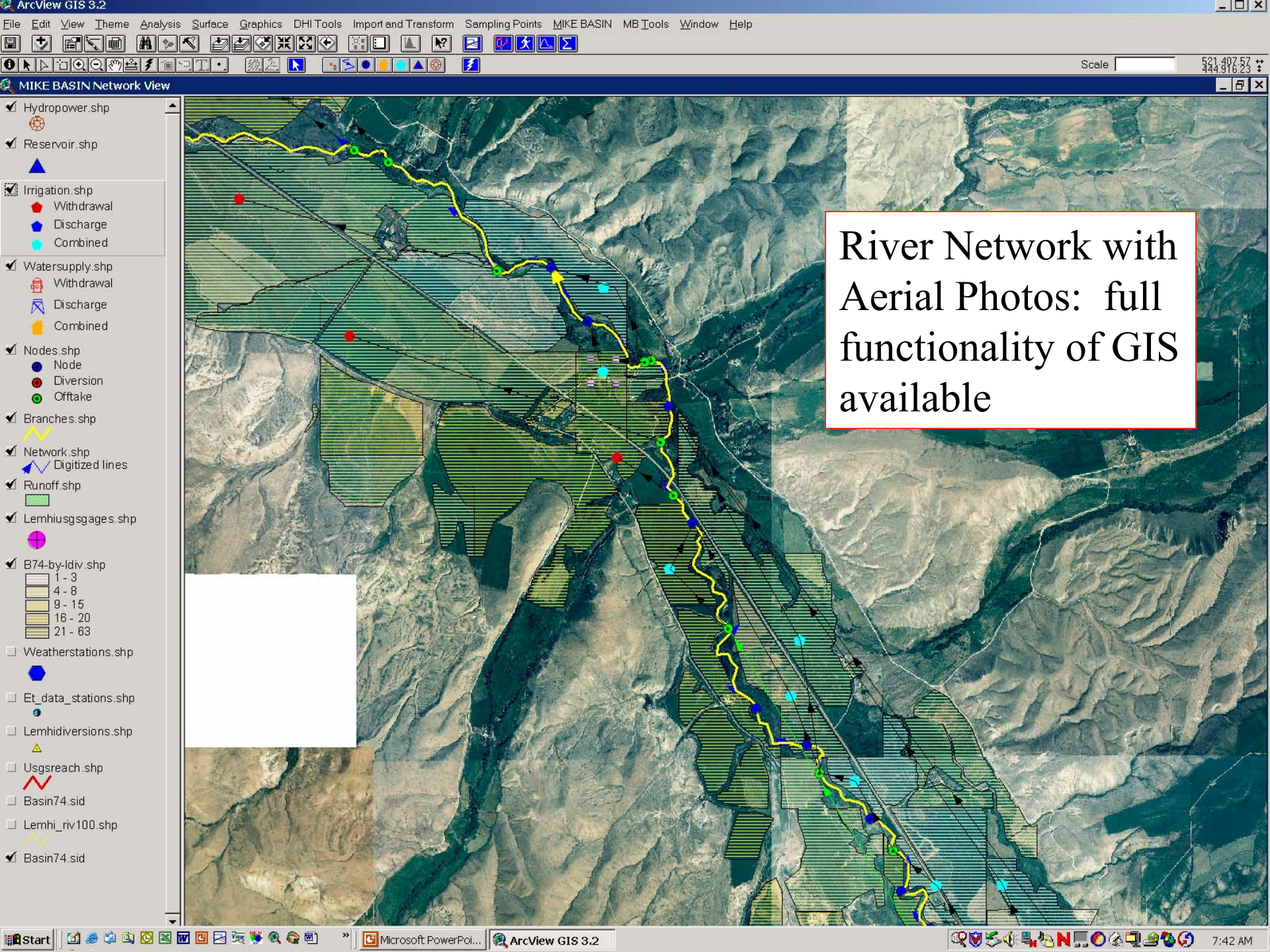

Thousand Springs MIKE
Basin Model
Progress Report
January 20, 2004
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
IDWR
DHI

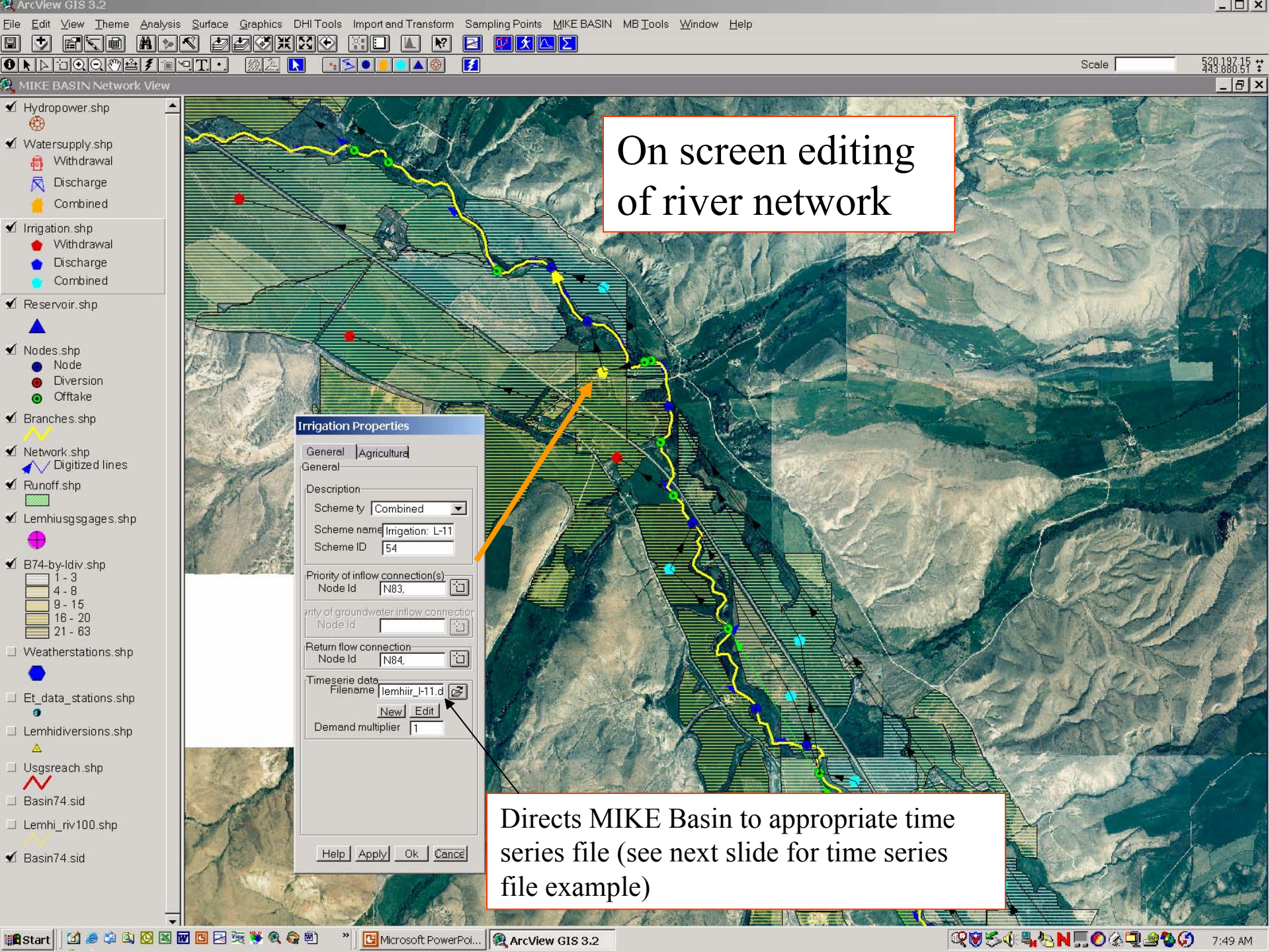
MIKE Basin: A Simple Concept

Overview




View GIS 3.2
Edit View Theme Analysis Surface Graphics DHI Tools Import and Transform Sampling Points MIKE BASIN MB Tools Window Help
Scale
MIKE BASIN Network View
dropower.shp
servoir.shp
gation.shp
Withdrawal
Discharge
Combined
tersupply.shp
Withdrawal
Discharge
Combined
des.shp
Node
Diversion
Offtake
nches.shp
work.shp
Digitized lines
noff.shp
nhiusgsgages.shp
4-by-ldiv.shp
1 - 3
4 - 8
9 - 15
16 - 20
21 - 63
eatherstations.shp
data_stations.shp
nhidiversions.shp
gsreach.shp
sin74.sid
nhi_riv100.shp
sin74.sid
River Network


ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics DHI Tools Import and Transform Sampling Points MIKE BASIN MB Tools Window Help
Scale
MIKE BASIN Network View
Hydropower.shp
Reservoir.shp
Irrigation.shp
Withdrawal
Discharge
Combined
Watersupply.shp
Withdrawal
Discharge
Combined
Nodes.shp
Node
Diversion
Offtake
Branches.shp
Network.shp
Digitized lines
Runoff.shp
Lemhiusgsgages.shp
B74-by-ldiv.shp
1 - 3
4 - 8
9 - 15
16 - 20
21 - 63
Weatherstations.shp
Et_data_stations.shp
Lemhidiversions.shp
Usgsreach.shp
Basin74.sid
Lemhi_riv100.shp
Basin74.sid
River Network with Aerial Photos: full functionality of GIS available
Start
Microsoft PowerPoi...
ArcView GIS 3.2
7:42 AM


On screen editing of river network
Irrigation Properties
General
Agricultura
General
Description
Scheme ty
Combined
Scheme name
Irrigation: L-11
Scheme ID
54
Priority of inflow connection(s)
Node Id
N83,
Node Id
Return flow connection
Node Id
N84,
Timeserie data
Filename
lemhiir_l-11.d
New
Edit
Demand multiplier
1
Help
Apply
Ok
Cance
Directs MIKE Basin to appropriate time series file (see next slide for time series file example)
MIKE BASIN Network View
Hydropower.shp
Watersupply.shp
Withdrawal
Discharge
Combined
Irrigation.shp
Withdrawal
Discharge
Combined
Reservoir.shp
Nodes.shp
Node
Diversion
Offtake
Branches.shp
Network.shp
Digitized lines
Runoff.shp
Lemhiusgsgages.shp
B74-by-ldiv.shp
1 - 3
4 - 8
9 - 15
16 - 20
21 - 63
Weatherstations.shp
Et_data_stations.shp
Lemhidiversions.shp
Usgsreach.shp
Basin74.sid
Lemhi_riv100.shp
Basin74.sid

Time Series File: Input and output format

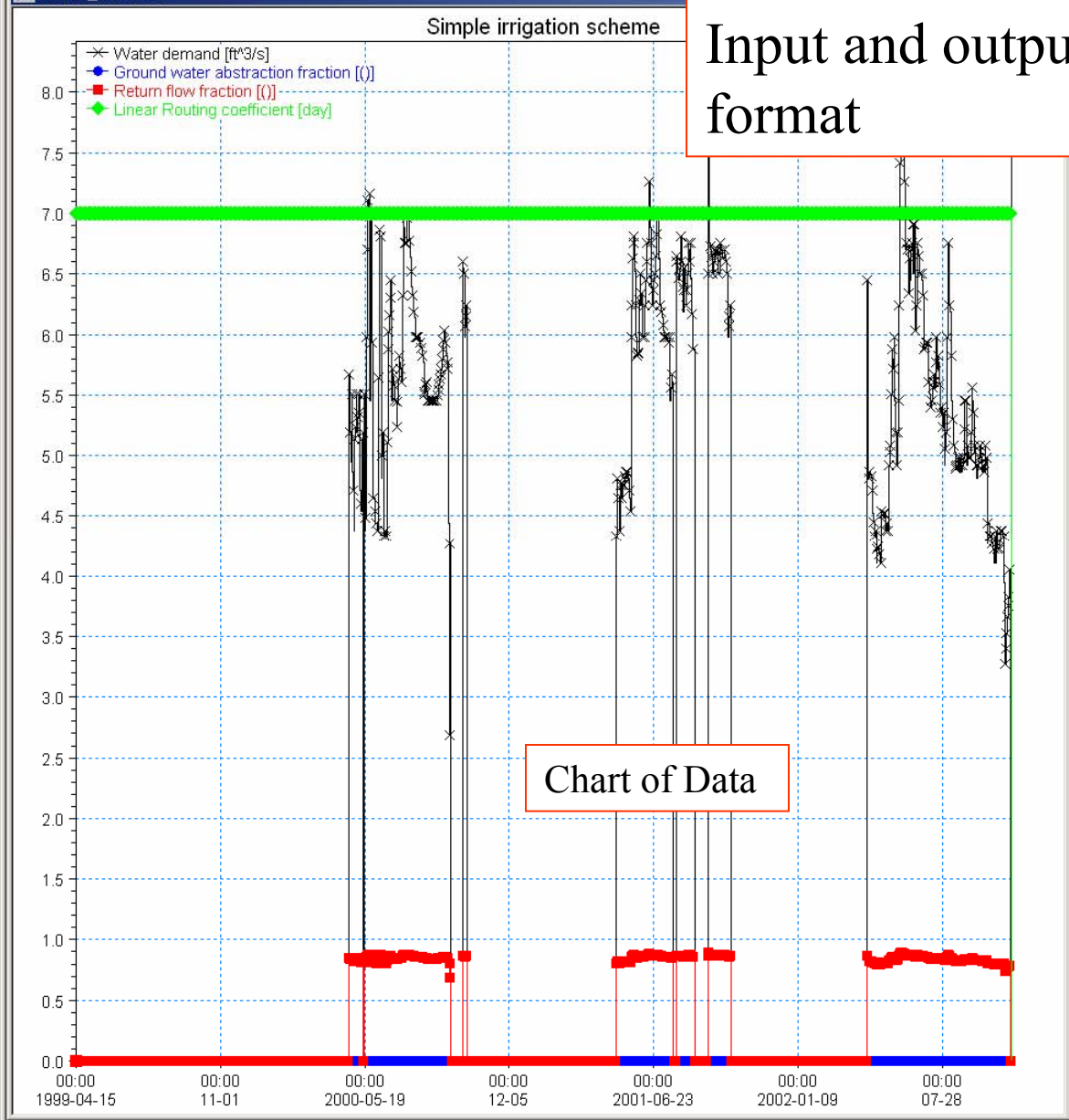
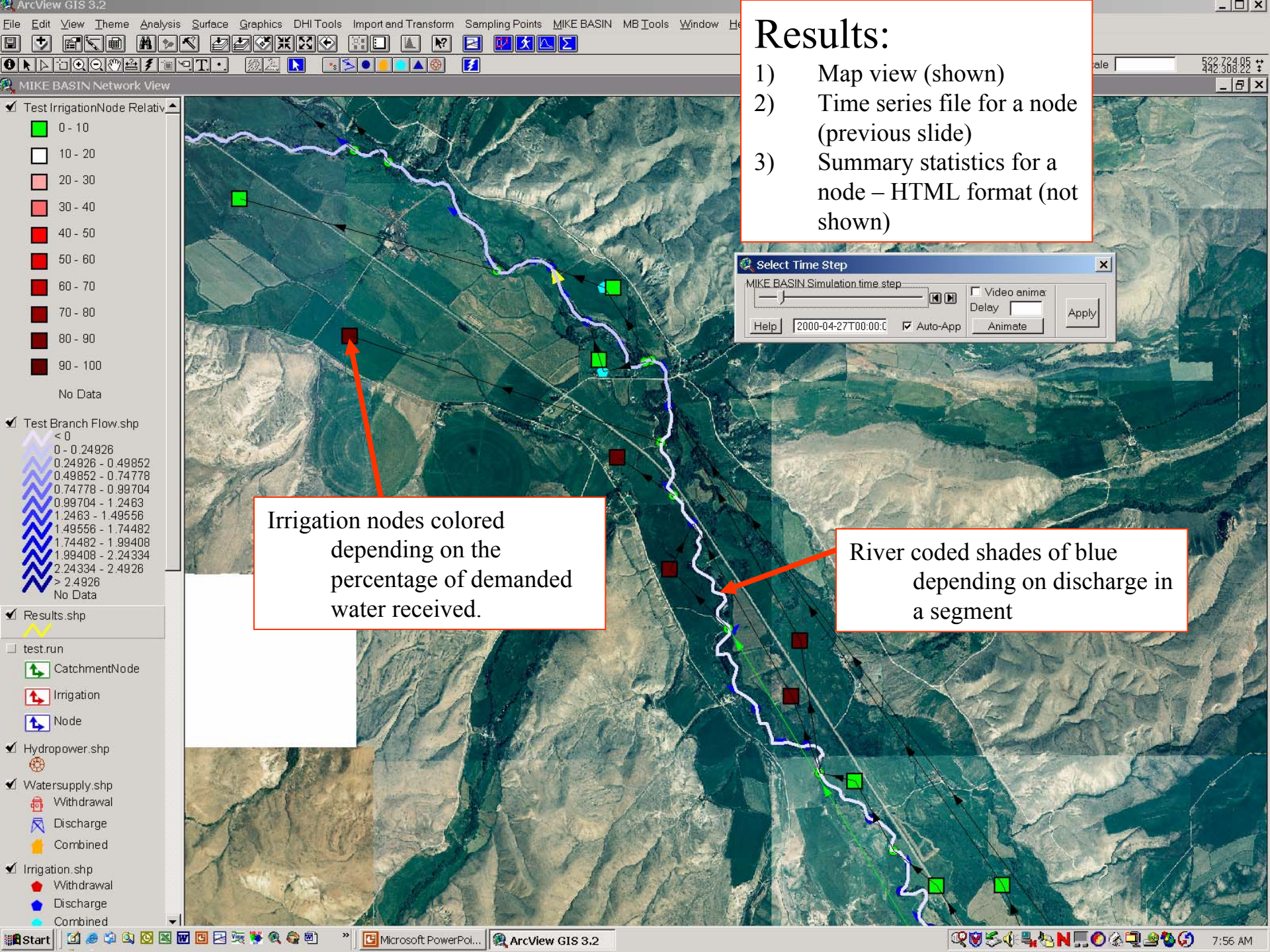


Chart of Data

Tabular Data

	ime	Water deman	Ground water	Return flow fr	Linear Routin
	1999 00:	0	0	0	7
	1999 00:	0	0	0	7
	1999 00:	0	0	0	7
	1999 00:	0	0	0	7
	1999 00:	0	0	0	7
	1999 00:	0	0	0	7
6	4/21/1999 00:	0	0	0	7
7	4/22/1999 00:	0	0	0	7
8	4/23/1999 00:	0	0	0	7
9	4/24/1999 00:	0	0	0	7
10	4/25/1999 00:	0	0	0	7
11	4/26/1999 00:	0	0	0	7
12	4/27/1999 00:	0	0	0	7
13	4/28/1999 00:	0	0	0	7
14	4/29/1999 00:	0	0	0	7
15	4/30/1999 00:	0	0	0	7
16	5/1/1999 00:0	0	0	0	7
17	5/2/1999 00:0	0	0	0	7
18	5/3/1999 00:0	0	0	0	7
19	5/4/1999 00:0	0	0	0	7
20	5/5/1999 00:0	0	0	0	7
21	5/6/1999 00:0	0	0	0	7
22	5/7/1999 00:0	0	0	0	7
23	5/8/1999 00:0	0	0	0	7
24	5/9/1999 00:0	0	0	0	7
25	5/10/1999 00:	0	0	0	7
26	5/11/1999 00:	0	0	0	7
27	5/12/1999 00:	0	0	0	7
28	5/13/1999 00:	0	0	0	7
29	5/14/1999 00:	0	0	0	7
30	5/15/1999 00:	0	0	0	7
31	5/16/1999 00:	0	0	0	7
32	5/17/1999 00:	0	0	0	7
33	5/18/1999 00:	0	0	0	7
34	5/19/1999 00:				7
35	5/20/1999 00:				7
36	5/21/1999 00:				7
37	5/22/1999 00:				7
38	5/23/1999 00:	0	0	0	7
39	5/24/1999 00:	0	0	0	7
40	5/25/1999 00:	0	0	0	7
41	5/26/1999 00:	0	0	0	7
42	5/27/1999 00:	0	0	0	7
43	5/28/1999 00:	0	0	0	7
44	5/29/1999 00:	0	0	0	7
45	5/30/1999 00:	0	0	0	7
46	5/31/1999 00:	0	0	0	7
47	6/1/1999 00:0	0	0	0	7
48	6/2/1999 00:0	0	0	0	7
49	6/3/1999 00:0	0	0	0	7
50	6/4/1999 00:0	0	0	0	7
51	6/5/1999 00:0	0	0	0	7



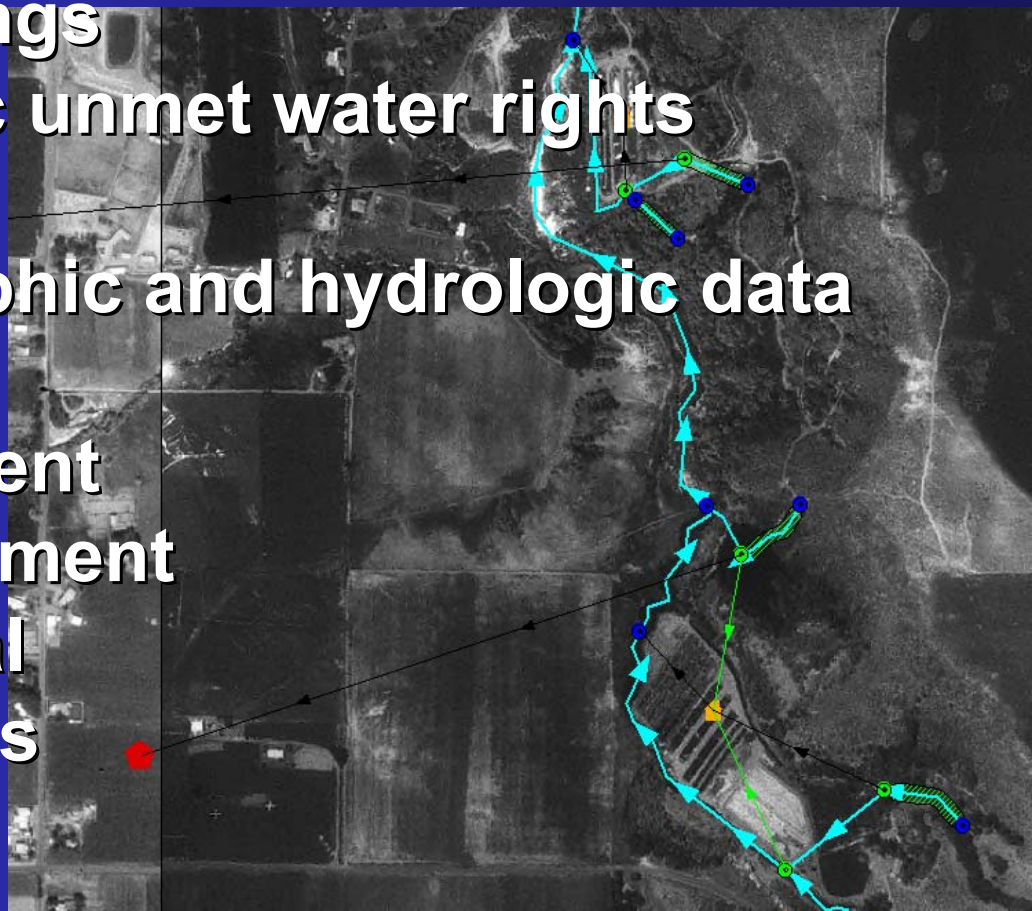
Results:

1) Map view (shown)
2) Time series file for a node (previous slide)
3) Summary statistics for a node – HTML format (not shown)

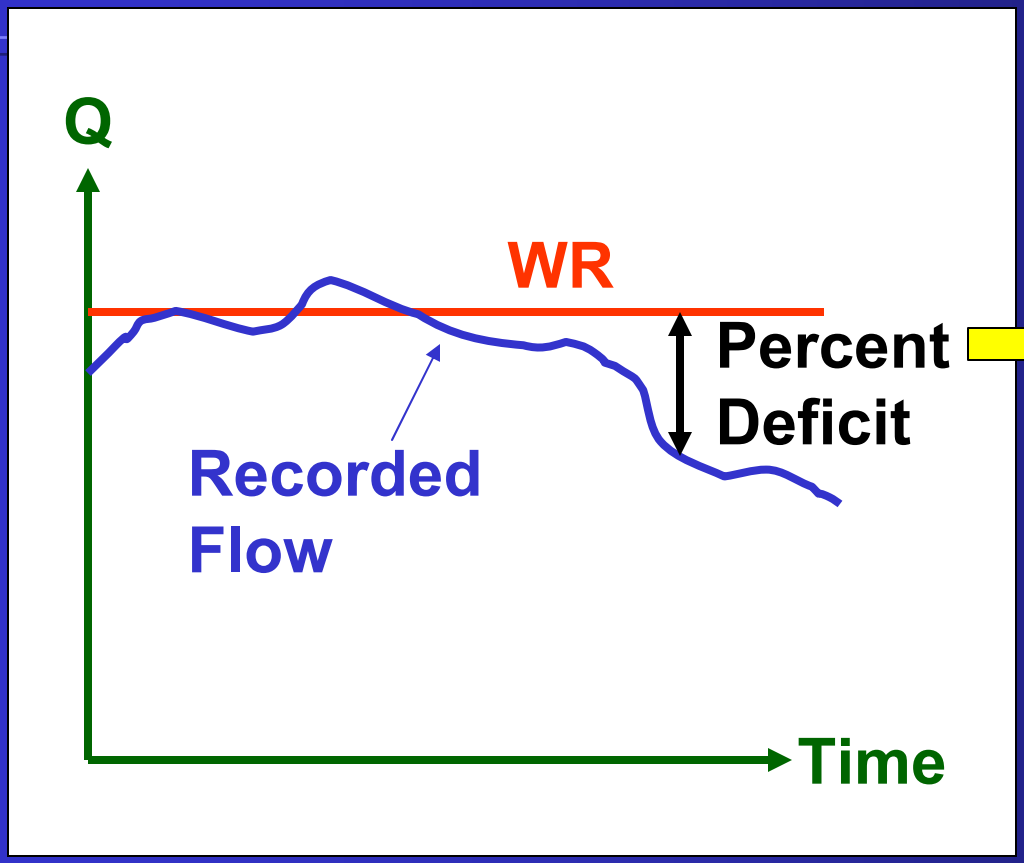
Thousand Springs

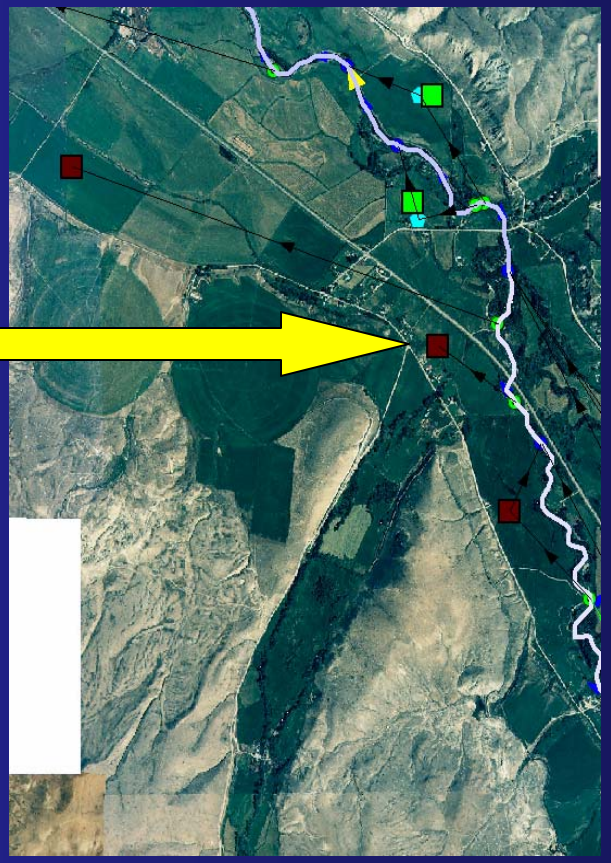
Thousand Springs MIKE Basin Model (TSMBM): Objectives

- Understand water movement around Thousands Springs
- Illustrate historic unmet water rights demands
- Compile geographic and hydrologic data
  - GIS
  - Water movement
  - Flow measurement
  - Meteorological
- Identify data gaps



TSMBM: Comparing Recorded Water Distribution with WR

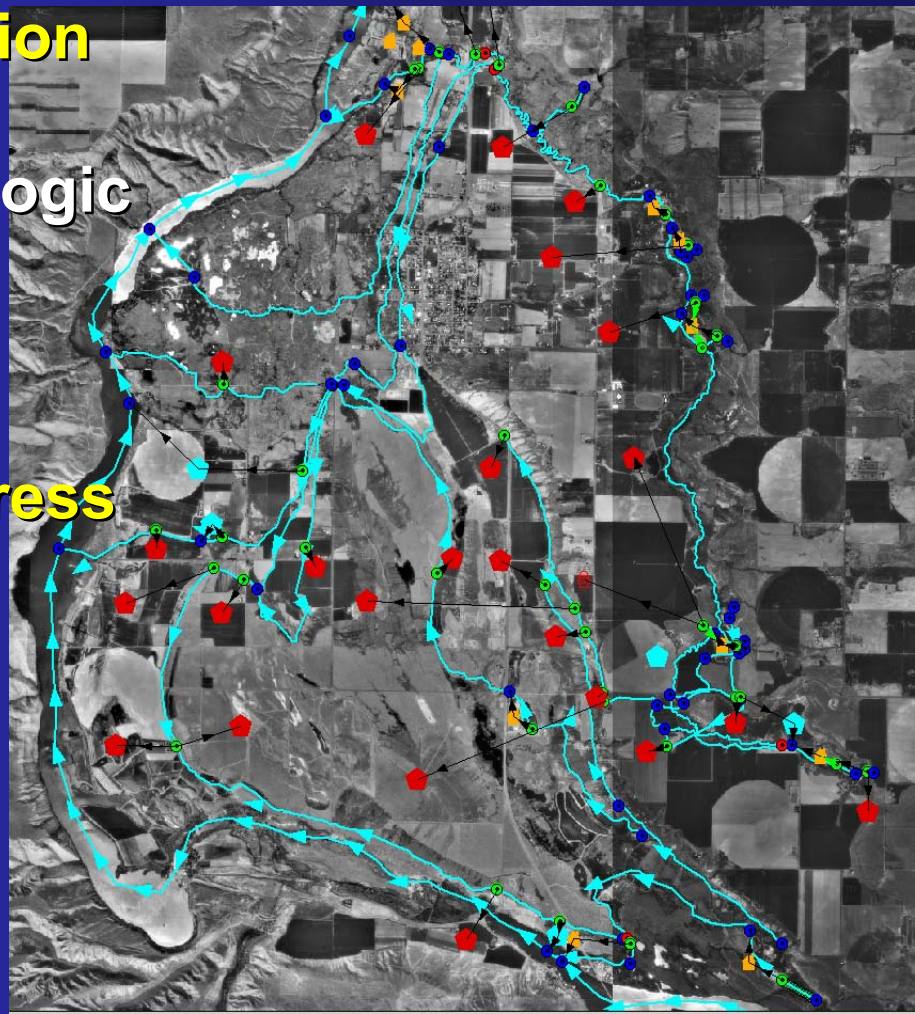




Thousand Springs

TSMBM: Model Procedure

- Model Set Up: Set up model network nearing completion
- Accumulation of Hydrologic Data: in progress
- Format/Population of Hydrologic Data: in progress
- Calibration:
- Verification



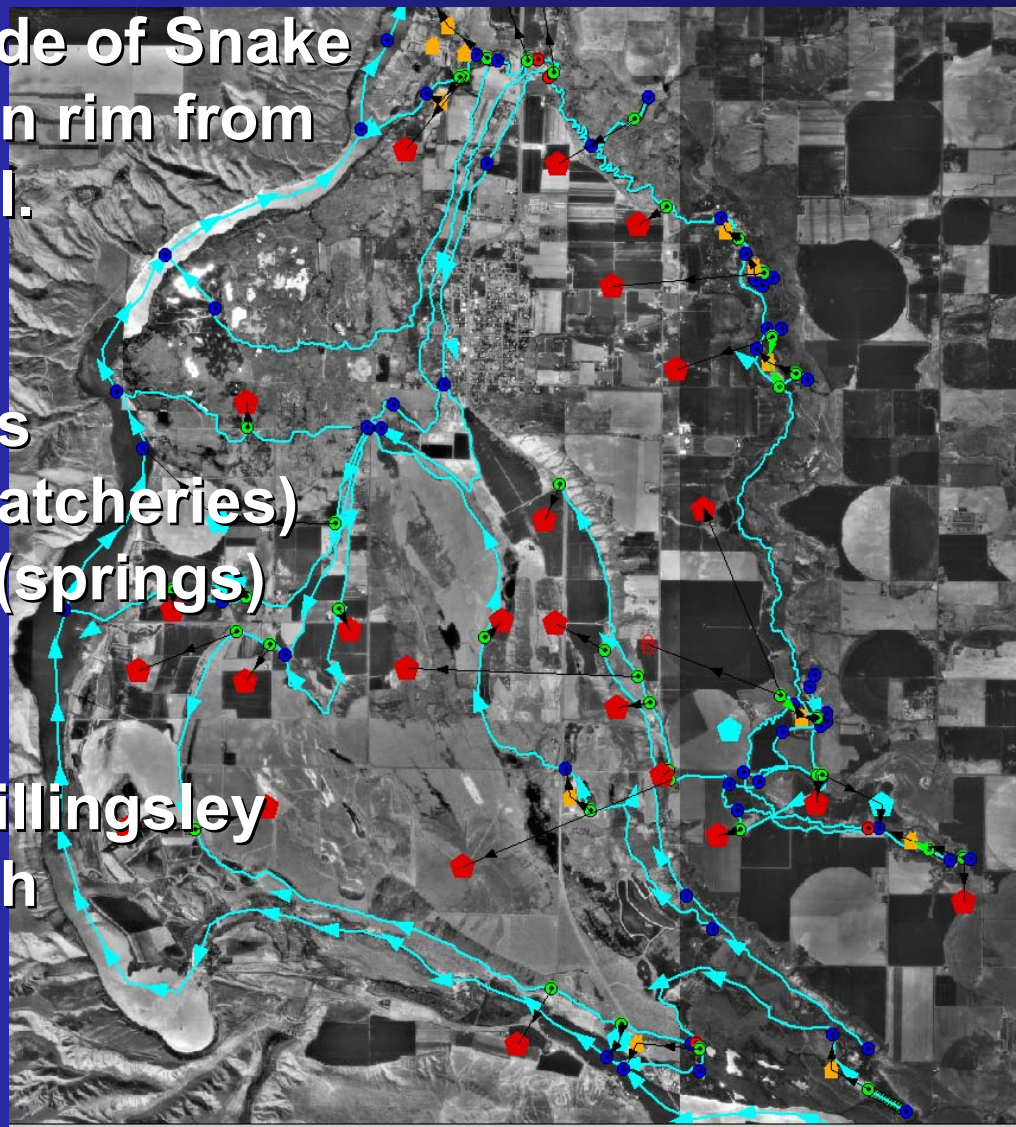
Thousand Springs

TSMBM: Model Network

- Study Area: north side of Snake River below the canyon rim from Blue Lakes to King Hill.

- Nodes (so far)
  - 35 Irrigation nodes
  - 18 DCMI nodes (hatcheries)
  - 15 Runoff basins (springs)
  - 11 Ditches

- Concentrate on the Billingsley Creek and Curren Ditch

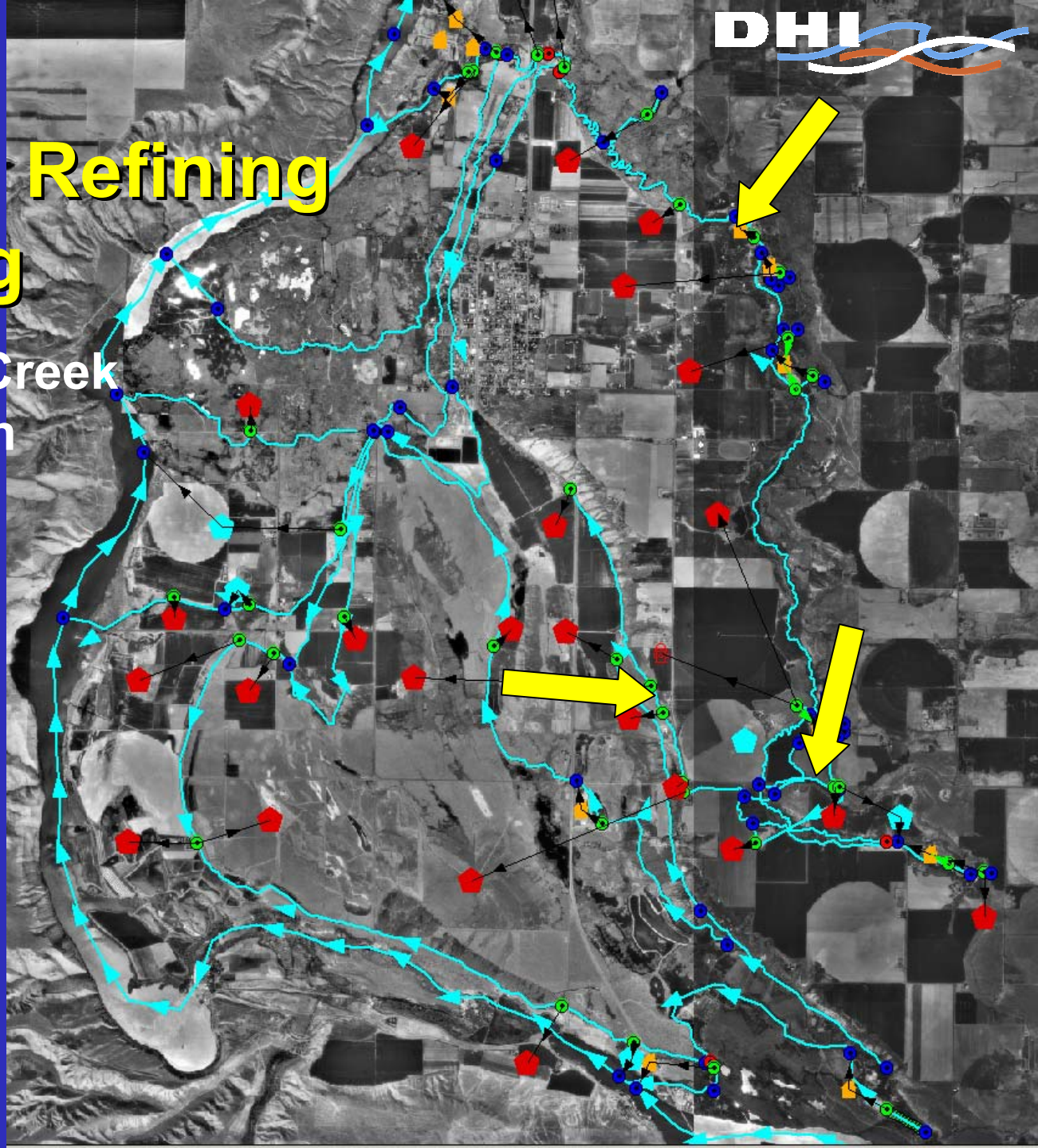


Thousand Springs

Thousand Springs

TSMBM: Refining Plumbing

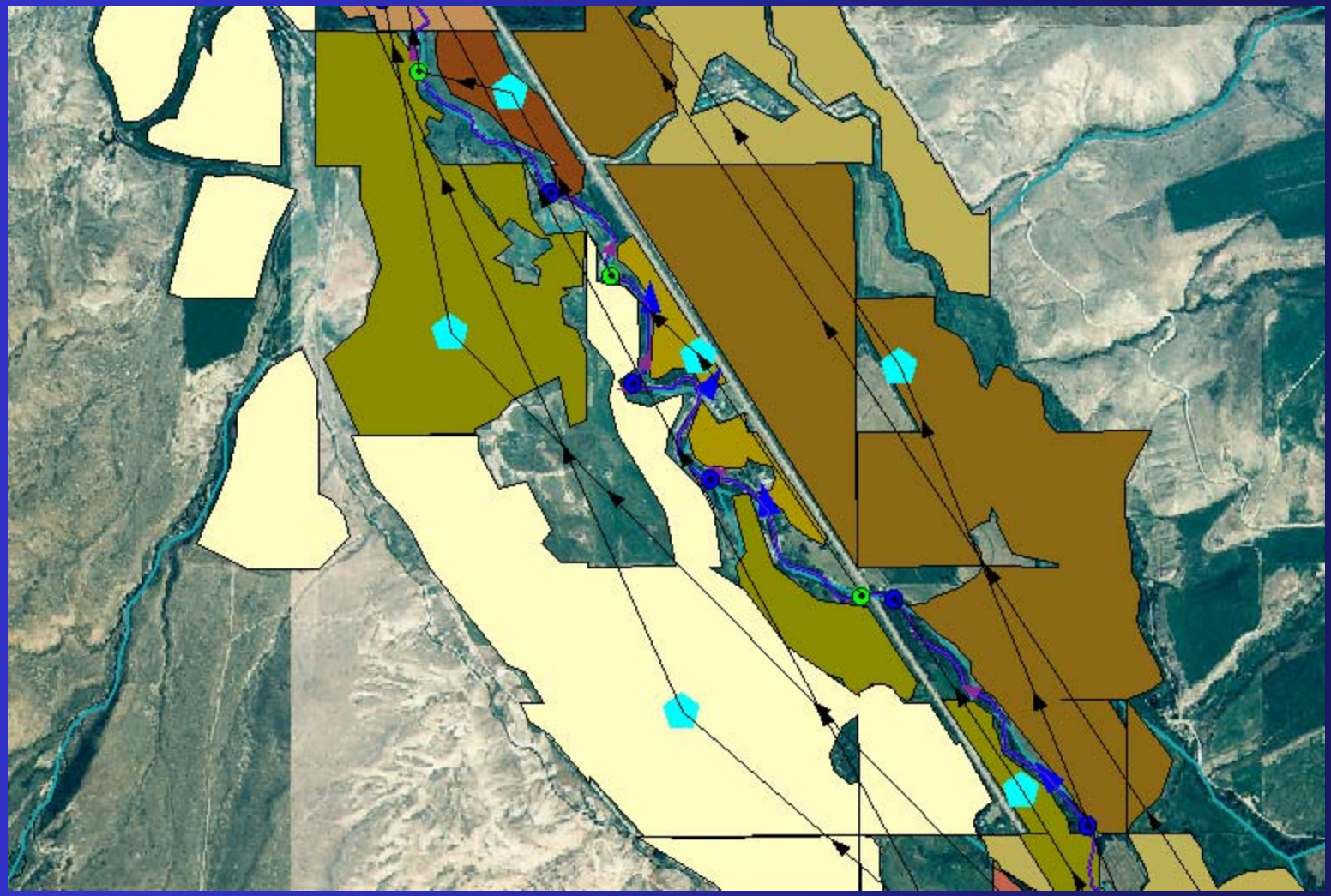
- Billingsley Creek
- Curren Ditch
- Bar S Ditch



Thousand Springs

TSMBM: Linking POD-POU

- Calculate WR/ET Rate serviced by a diversion



TSMBM: Populating Model with Data

Microsoft Excel - TS-div-timeseries.xls

File Edit View Insert Format Tools Data Window Help

Arial 10 B I U

D5

TSMBM: Time Series File

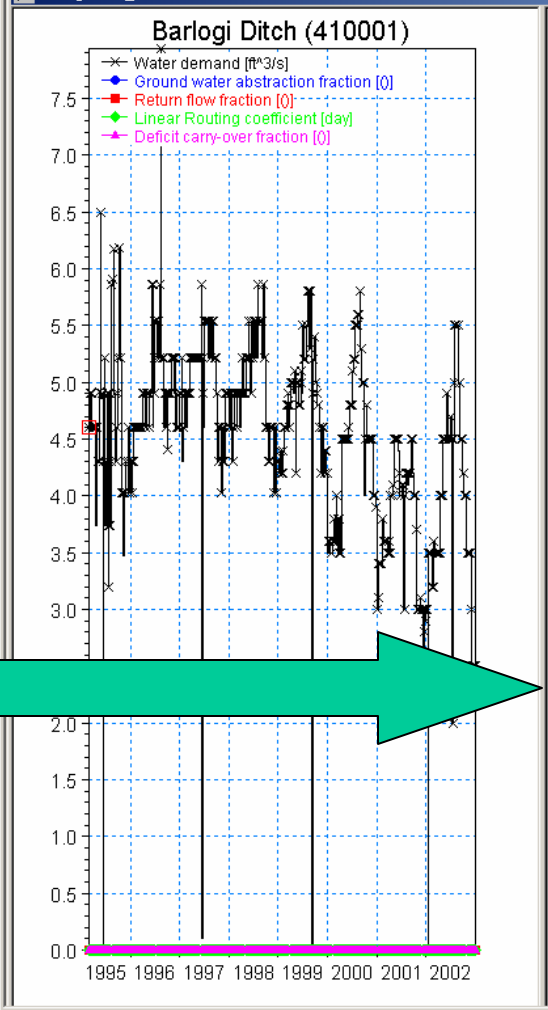
Diversion Name	BARLOGI DITCH				
Div Type	D			Source	BILLINGSLEY C
WD Div No.	410001			Div Comments	MEAS. DEVICE
DWR Div No	410001			DHI Type	ag
Time Series	Start	3/1/1995		DHI TS File 1	barlogiditch_ag.d
	End	12/31/2002		DHI TS File 2	

Date	Q (cfs)	GW Fraction ()	Return Fraction ()	Lag Time ()	Deficit Carryover ()
3/1/1995	4.61	0	0	0	0
3/2/1995	4.61	0	0	0	0
3/3/1995	4.61	0	0	0	0
3/4/1995	4.61	0	0	0	0
3/5/1995	4.61	0	0	0	0
3/6/1995	4.91	0	0	0	0
3/7/1995	4.91	0	0	0	0
3/8/1995	4.91	0	0	0	0
3/9/1995	4.91	0	0	0	0
3/10/1995	4.91	0	0	0	0
3/11/1995	4.91	0	0	0	0
3/12/1995	4.91	0	0	0	0
3/13/1995	4.91	0	0	0	0
3/14/1995	4.91	0	0	0	0
3/15/1995	4.91	0	0	0	0
3/16/1995	4.91	0	0	0	0
3/17/1995	4.91	0	0	0	0
3/18/1995	4.91	0	0	0	0
3/19/1995	4.91	0	0	0	0
3/20/1995	4.61	0	0	0	0
3/21/1995	4.61	0	0	0	0
3/22/1995	4.61	0	0	0	0
3/23/1995	4.61	0	0	0	0
3/24/1995	4.61	0	0	0	0
3/25/1995	4.61	0	0	0	0
3/26/1995	4.61	0	0	0	0

TSEdit - barlogiditch_div.dfs0

File Edit View Settings Tools Window Help

barlogiditch_div.dfs0



	Time	Water dema	Ground wat	Return flow	Linear Routi
0	3/1/1995 00:	4.61	0	0	0
1	3/2/1995 00:	4.61	0	0	0
2	3/3/1995 00:	4.61	0	0	0
3	3/4/1995 00:	4.61	0	0	0
4	3/5/1995 00:	4.61	0	0	0
5	3/6/1995 00:	4.91	0	0	0
6	3/7/1995 00:	4.91	0	0	0
7	3/8/1995 00:	4.91	0	0	0
8	3/9/1995 00:	4.91	0	0	0
9	3/10/1995 00	4.91	0	0	0
10	3/11/1995 00	4.91	0	0	0
11	3/12/1995 00	4.91	0	0	0
12	3/13/1995 00	4.91	0	0	0
13	3/14/1995 00	4.91	0	0	0
14	3/15/1995 00	4.91	0	0	0
15	3/16/1995 00	4.91	0	0	0
16	3/17/1995 00	4.91	0	0	0
17	3/18/1995 00	4.91	0	0	0
18	3/19/1995 00	4.91	0	0	0
19	3/20/1995 00	4.61	0	0	0
20	3/21/1995 00	4.61	0	0	0
21	3/22/1995 00	4.61	0	0	0
22	3/23/1995 00	4.61	0	0	0
23	3/24/1995 00	4.61	0	0	0
24	3/25/1995 00	4.61	0	0	0
25	3/26/1995 00	4.61	0	0	0
26	3/27/1995 00	4.61	0	0	0
27	3/28/1995 00	4.61	0	0	0
28	3/29/1995 00	4.61	0	0	0
29	3/30/1995 00	4.61	0	0	0
30	3/31/1995 00	4.61	0	0	0
31	4/1/1995 00:	4.61	0	0	0
32	4/2/1995 00:	4.61	0	0	0
33	4/3/1995 00:	4.61	0	0	0
34	4/4/1995 00:	4.61	0	0	0
35	4/5/1995 00:	4.61	0	0	0
36	4/6/1995 00:	4.61	0	0	0
37	4/7/1995 00:	4.61	0	0	0
38	4/8/1995 00:	4.61	0	0	0
39	4/9/1995 00:	4.61	0	0	0
40	4/10/1995 00	4.61	0	0	0
41	4/11/1995 00	4.61	0	0	0
42	4/12/1995 00	4.61	0	0	0
43	4/13/1995 00	4.61	0	0	0
44	4/14/1995 00	4.61	0	0	0
45	4/15/1995 00	4.61	0	0	0

Ready

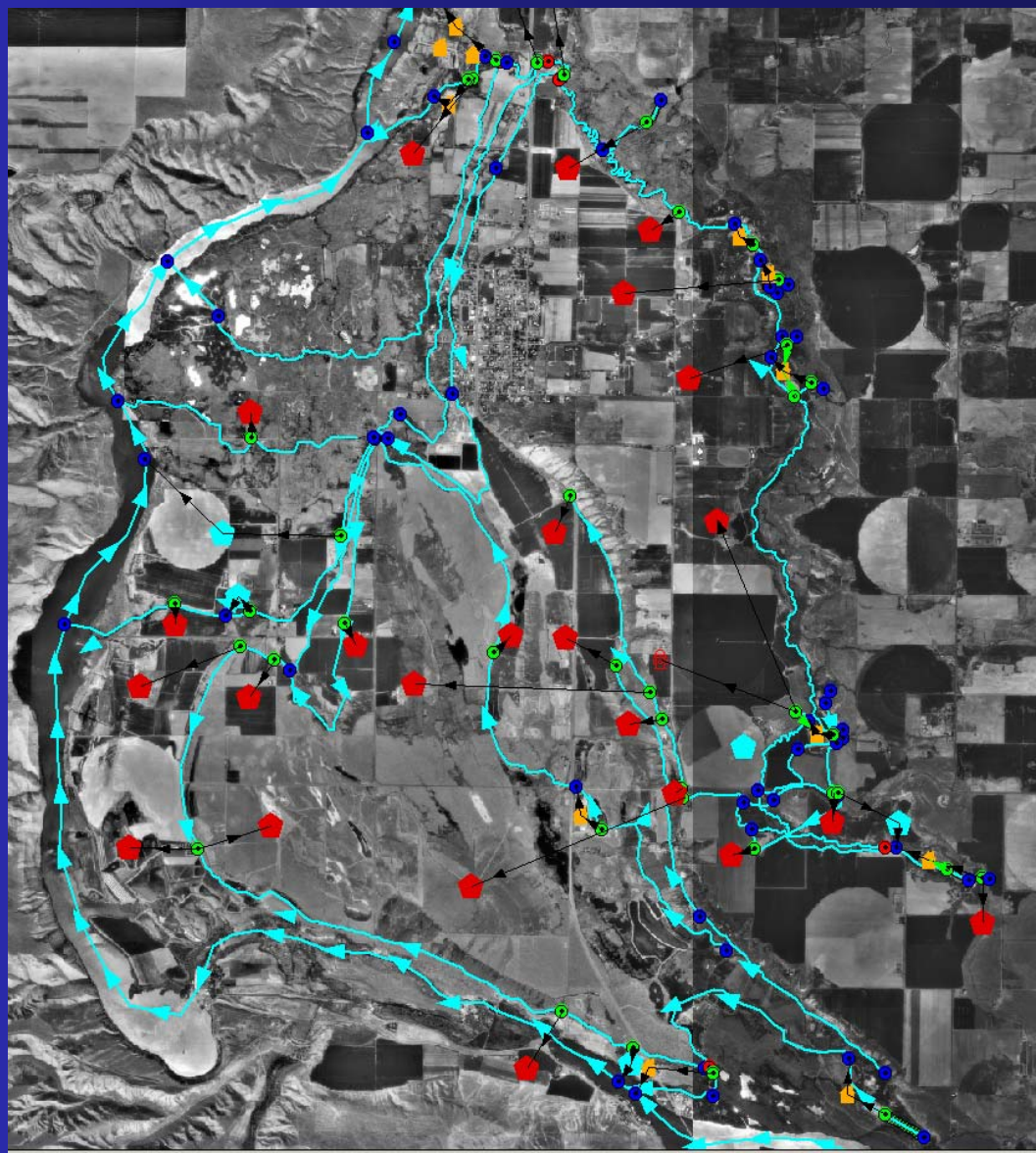
12/12/2002 2:09:21 PM 4.94812

TSMBM: Data Availability

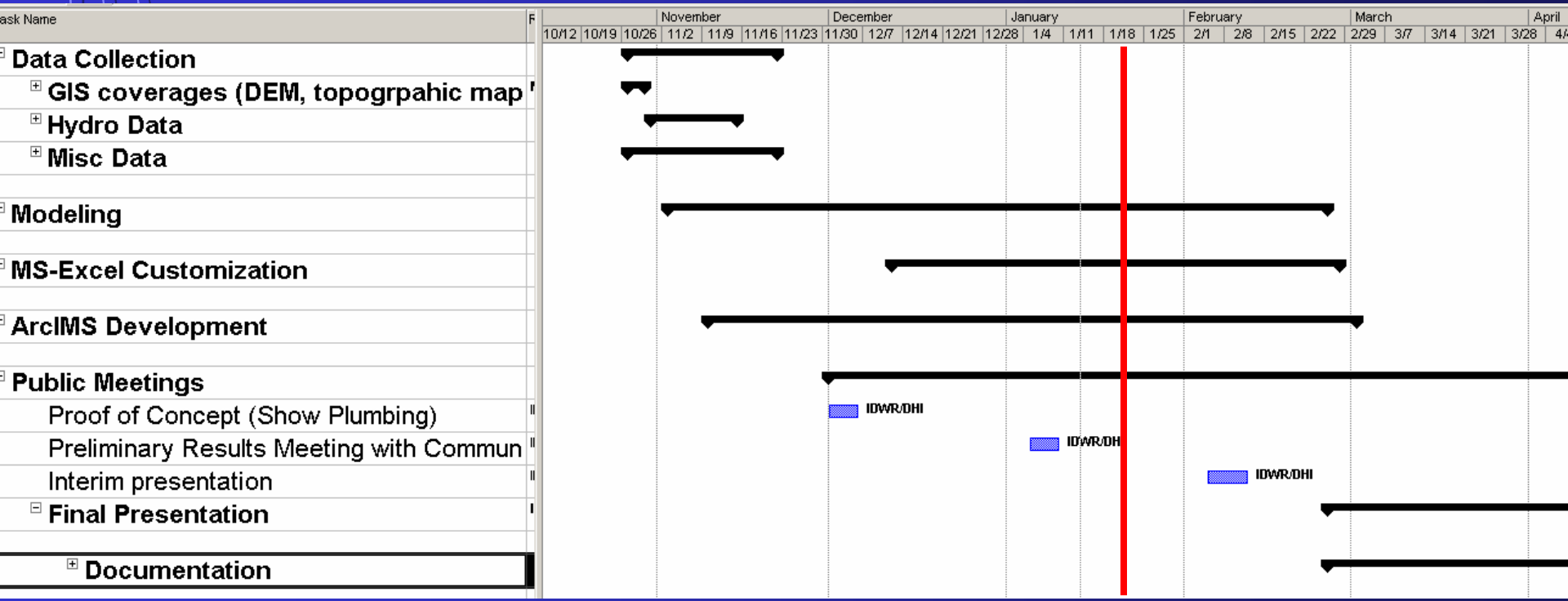
Thousand Springs

Beginning Date

Year	% Time Series
1995	14.3
1996	71.4
1997	0.0
1998	4.3
1999	7.1
2000	2.9



TSMBM: Schedule



TSMBM: To Do

Remaining in the project

- Finish model network and data population
- Calibration
- Evaluate historic allocation vs. WR
- ArcIMS development

Thousand Springs

TSMBM: Future Development

Beyond the project

- Extend the model to entire study area
- Distribute water according to water rights for “what-if” scenarios
- Eventually link to groundwater model

Thousand Springs

Thousands Springs

Conclusion

- An integrated depiction of water availability, movement, and use that can be viewed directly on GIS maps
- A surface water model to examine unmet WR demands
- Compilation of hydrologic data from numerous sources in one convenient place, posted to web
- Identification of data deficiencies to more efficiently guide expenditures for future data collection efforts

Contact:

Carter Borden

(208) 364-9906

Jcb@dhigroup.com